

Serial No. 10/601,030  
Attorney Docket No. RA-5482  
Examiner Brian R. Peugh, Group Art Unit 2187

Response After Final Rejection  
February 27, 2006

It is requested that the Claims be amended as follows:

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2 1. (Currently Amended) For use in a system having multiple processors in a  
3 processing node coupled to a memory, a method, comprising:

4 a.) receiving multiple requests for data from the multiple processors;

5 b.) if ones of the multiple requests are requesting the same data, creating  
6 a respective linked list in the processing node to record the ones of the multiple  
7 requests; and

8 c.) issuing one of the requests recorded by each linked list from the  
9 processing node to the memory.

1 2. (Original) The method of Claim 1, wherein each linked list orders requests in  
2 order of receipt, and wherein the issued request is the oldest pending request.

1 3. (Original) The method of Claim 1, wherein the memory issues memory  
2 requests to the multiple processors for the return of data to the memory, and if a  
3 memory request is requesting the same data as requests recorded within a  
4 linked list, adding the memory request to the linked list.

1 4. (Original) The method of Claim 1, and further including:

2 receiving requested data from the memory;

3 if the received data was requested by requests recorded in a linked list,  
4 providing the received data to a processor that issued a predetermined one of  
5 the requests included in the linked list;

6 removing the predetermined request from the linked list; and  
7 processing all requests remaining in the linked list.

1 5. (Original) The method of Claim 4, wherein the predetermined request is the  
2 oldest-pending request in the linked list.

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1 6. (Original) The method of Claim 4, wherein the processing step includes:  
2 making the next request in the linked list the current request;  
3 requesting return of the received data from whichever one of the multiple  
4 processors last retained the data;  
5 providing the received data to whichever one of the multiple processors is  
6 indicated by the current request; and  
7 removing the current request from the linked list.

1 7. (Original) The method of Claim 6, wherein the memory issues memory  
2 requests to the multiple processors for the return of data to the memory, wherein  
3 a memory request requesting the same data as requests recorded by a linked list  
4 is added to the linked list, and wherein the providing step includes providing the  
5 received data to the memory if the memory is indicated by the current request.

1 8. (Original) The method of Claim 7, wherein a shared cache is coupled to the  
2 multiple processors, and further including:  
3 attempting to retrieve the received data from the shared cache; and  
4 if, in response to the requesting step, none of the multiple processors  
5 returns the received data, the providing step includes providing any data  
6 retrieved from the shared cache to whichever one of the multiple processors or  
7 the memory is indicated by the current request.

1 9. (Original) The method of Claim 8, wherein if, in response to the requesting  
2 step, none of the multiple processors returns the received data, and if the  
3 received data is not resident in the shared cache, indicating the current request  
4 must be retried.

1 10. (Original) The method of Claim 9, wherein the step of receiving requested  
2 data from the memory occurs before all invalidation operations are completed for  
3 the received data, and further including preventing predetermined data from

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4 being provided to the memory until predetermined invalidation operations are  
5 completed.

1 11. (Original) The method of Claim 6, wherein the requesting and providing steps  
2 of Claim 6 are performed during an indivisible operation.

1 12. (Currently Amended) A method of processing requests ~~from~~ generated by  
2 requesters and provided to a memory, including:  
3 a.) receiving a request for data stored in the memory;  
4 b.) if the request is requesting the same data as another pending request  
5 that has not yet been provided from the requesters to the memory, linking the  
6 request to the other pending request before either of the requests is provided by  
7 the requesters to the memory; and  
8 c.) repeating steps a.) and b.) for any additional requests issued to the  
9 memory.

1 13. (Original) The method of Claim 12, wherein steps a.) through .c) include  
2 creating multiple linked lists of requests, each respectively associated with  
3 different data.

1 14. (Currently Amended) The method of Claim 13, and further including:  
2 d.) when data for the pending request is received from the memory,  
3 providing the data to a requester that issued the pending request; and  
4 e.) if the pending request is linked to any other request, requesting that  
5 the data be returned by a requester indicated by the pending request so that the  
6 any other linked request may be processed.

1 15. (Original) The method of Claim 14, and further including:  
2 f.) providing the data to satisfy the linked request.

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1 16. (Original) The method of Claim 15, and further including:  
2 g.) making the linked request the current request;  
3 h.) if the current request is linked to a request, requesting that the data be  
4 returned by a requester that most recently retained the data;  
5 i.) providing returned data to satisfy the linked request; and  
6 j.) repeating steps g.) through i.) for any additional requests in the linked  
7 list.

1 17. (Original) The method of Claim 16, wherein at least one of steps e.) and h.)  
2 include requesting that the data is returned with predetermined access rights that  
3 are based on a type of the current request and the linked request.

1 18. (Original) The method of Claim 16, wherein at least one of steps e.) and h.)  
2 include requesting that the data is returned with predetermined access rights  
3 based on rights that were granted by the memory for the data.

1 19. (Original) The method of Claim 16, wherein at least one of steps e.) and h.) is  
2 performed in a manner that is determined programmably.

1 20. (Currently Amended) A system for processing requests to a memory,  
2 comprising:  
3 multiple requesters in a processing node to issue requests for data;  
4 a request tracking circuit in the processing node ~~coupled to the multiple~~  
5 ~~requesters~~ to retain a record of each request until the request is completed, and  
6 to associate a request with any other one or more requests for the same data so  
7 that a single request for any given data is pending provided from the processing  
8 node ~~the multiple requesters~~ to the memory at a given time.

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1 21. (Original) The system of Claim 20, wherein the request tracking circuit  
2 includes a storage device to store multiple requests for the same data in a  
3 respective linked list of requests.

1 22. (Original) The system of Claim 21, wherein the request tracking circuit  
2 includes a control circuit to receive data from the memory, and to provide the  
3 received data to one of the multiple requesters based on information stored  
4 within the storage device.

1 23. (Original) The system of Claim 22, wherein if the received data is received in  
2 response to a request that has been associated with other requests, the control  
3 circuit provides the received data to whichever requester issued the oldest one of  
4 the associated requests, and processes each of the other associated requests in  
5 the order in which the other associated requests were recorded by the request  
6 tracking circuit.

1 24. (Previously Amended) The system of Claim 23, wherein the control circuit  
2 includes circuits to process each of the other associated requests by attempting  
3 to obtain the received data from one of the multiple requesters, then providing  
4 any obtained data to a requester that is identified by the request that is being  
5 processed.

1 25. (Original) The system of Claim 24, wherein the control circuit includes a  
2 circuit to cause a requester to reissue a request if, during processing of a  
3 request, data requested by the request could not be obtained.

1 26. (Original) The system of Claim 24, wherein the request tracking circuit  
2 includes a remote tracker circuit to store a record of a request received from the  
3 memory that is requesting that same data as one or more requests recorded  
4 within the request tracking circuit.

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1 27. (Original) The system of Claim 25, wherein the control circuit includes a  
2 circuit to process the request from memory by attempting to obtain the requested  
3 data, then providing any obtained data to the memory.

1 28. (Original) The system of Claim 23, wherein the memory provides data to the  
2 request tracking circuit before all invalidation operations for the data have been  
3 completed, and wherein the request tracking circuit includes a circuit to prevent  
4 predetermined data retained by predetermined ones of the multiple requesters  
5 from being returned to the memory before all of the invalidation operations are  
6 completed.

1 29. (Previously Amended) A data processing system comprising:  
2 a memory;  
3 a processing node coupled to the memory and having one or more  
4 requesters to generate requests for data to the memory, wherein the processing  
5 node includes a requesting tracking circuit to record, in time-order, requests  
6 issued for the same data, and to allow only one of the requests for the same data  
7 from being issued to the memory at a given time.

1 30. (Original) The system of Claim 29, wherein the processing node includes  
2 multiple processors, and wherein the requesting tracking circuit includes a control  
3 circuit to receive data returned from the memory, the control circuit to provide the  
4 data to the processor associated with the oldest request pending for the data.

1 31. (Original) The system of Claim 30, wherein the control circuit includes a  
2 circuit to determine whether other requests are pending for the received data,  
3 and for each of the other pending requests, attempting to obtain the data from  
4 whichever of the multiple processors last retained the data, then providing any  
5 obtained data to a processor that is associated with the request being processed.

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1 32. (Original) The system of Claim 31, wherein the control circuit processes the  
2 multiple requests for the received data in an order in which the multiple requests  
3 were received.

1 33. (Original) The system of Claim 32, wherein the request tracking circuit  
2 includes a control store to store programmable data to indicate the manner in  
3 which the data is to be obtained from a processor based on access rights  
4 retained by the processor for the data and the access rights requested by the  
5 processor associated with the request being processed.

1 34. (Previously Amended) A system for processing requests to a memory,  
2 including:  
3 processing means for originating the requests to the memory; and  
4 request tracking means for receiving the requests, and for forming an  
5 association between any of the requests that are requesting the same data, and  
6 for allowing only one of the associated requests to be provided from the  
7 processing means to the memory.

1 35. (Original) The system of Claim 34, wherein the association records an order  
2 of receipt of the requests that are requesting the same data.

1 36. (Original) The system of Claim 35, wherein the request tracking means  
2 includes control means for receiving data from the memory, and if the received  
3 data was requested by associated requests that are requesting the same data,  
4 for processing each of the associated requests in the order in which the requests  
5 were received.

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- 1 37. (Original) The system of Claim 36, wherein the control means includes means
- 2 for processing each request by obtaining the data with access rights required to
- 3 process the request, then providing the data to the processing means with the
- 4 required access rights.